

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
25 January 2001 (25.01.2001)

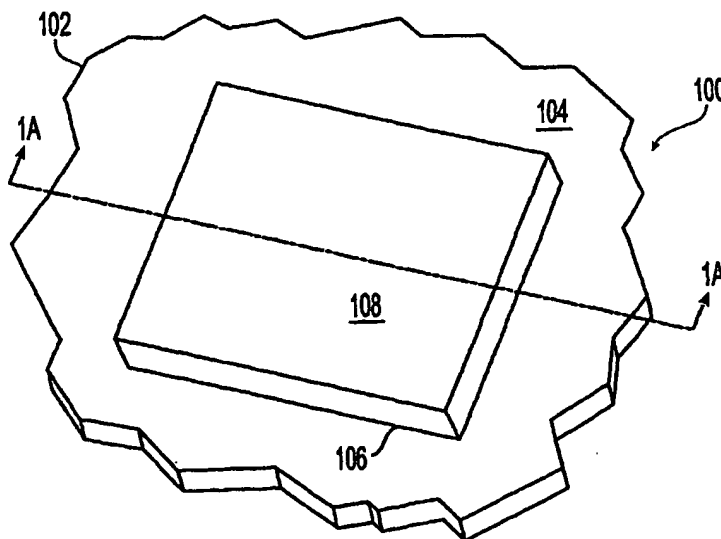
PCT

(10) International Publication Number
WO 01/06543 A3

- (51) International Patent Classification⁷: **G02B 26/02**
- (21) International Application Number: **PCT/IL00/00431**
- (22) International Filing Date: **20 July 2000 (20.07.2000)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
60/144,628 20 July 1999 (20.07.1999) US
60/170,492 13 December 1999 (13.12.1999) US
60/170,494 13 December 1999 (13.12.1999) US
- (71) Applicant (for all designated States except US): **MEM-LINK LTD. [IL/IL]; Hataas Street 4, 52512 Ramat Gan (IL).**
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **CHERTKOW, Roberto, Igal [IL/IL]; Hermon St. 6B/8, 77709 Ashdod (IL).**
- (54) Agent: **FRIEDMAN, Mark, M.; Beit Samueloff, Haomanim Street 7, 67897 Tel Aviv (IL).**
- (81) Designated States (national): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.**
- (84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).**
- Published:
— With international search report.
- (88) Date of publication of the international search report:
25 May 2001

[Continued on next page]

(54) Title: **MICROELECTROMECHANICAL DEVICE WITH MOVING ELEMENT**



(57) Abstract: A microelectromechanical (MEMS) device (100) has a substrate (102) and a generally planar moving element (106), such as a mirror, disposed in parallel to the surface (108) of the substrate. An actuator is operatively engageable with the moving element (106) for selectively actuating the moving element (106) between a first position in a plane horizontal to the surface of the substrate and a second position in that plane. The MEMS device (100) may be effectively used as an optical switch. Various different actuators can be used. Preferably, the device is fabricated using a surface micromachining process.

WO 01/06543 A3

WO 01/06543 A3



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL00/00431

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G02B 26/02

US CL : 359/230, 224; 385/18, 19

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 359/230, 224, 198, 199, 214, 221, 223, 226

385/18, 19, 16, 17, 20-24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,914,801 A (Dhuler et al.) 22 June 1999 (22/06/99) see figure 1A and cols. 5 and 6	1-38
X,P	US 6,134,042 A (Dhuler et al.) 17 October 2000 (17/10/2000) see figure 1A and cols. 5 and 6	1-38



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

Z

document member of the same patent family

Date of the actual completion of the international search

25 FEBRUARY 2001

Date of mailing of the international search report

07 MAR 2001

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

PHAN T. H. PALMER

Telephone No. (703) 308-4848